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Page 395, line 34, for "*proptera*" read "*Proptera*".

Page 396, line 20, for "*tecxasensis*" read "*texasensis*".

Page 400, line 6, for "central" read "center"; after line 10 supply the following deletion from text:—

SHELL CHARACTERS:—Shell elliptical, small or medium, beak sculpture rather double-looped or distinctly sinuate with posterior sinuation somewhat open.

ERRATA.

(PLATES I—XXVIII.)

Pl. I, Fig. 2, for "vavel" read "valve".

Pl. II, Fig. 5a, Supply label 4, i. e., "Extreme dorsal point."

Pl. V, Fig. 12b, for "*Utterbacki*" read "*Utterbackii*"; do. Pl. XX, Figs. 63 A—D.

Pl. VI, Figs. 14 a—d, for "*Curtisi*" read "*Curtisii*"; do. Pl. XXVIII, Figs. 109 A—D.

Pl. IX, Fig. 19, After "feeding" supply comma and "respiring".

Pl. XIII, Fig. 26, Supply "-Hundred" after "One;" do. Pl. XXVI, Fig. 90.

Pl. XVI, Figs. 38 A—D, for "*Quintardi*" read "*Quintardii*".

Pl. XIX, Fig 52, for "*cylindirca*" read "*cylindrica*".

Pl. XXV, Fig. 81, for "*clintonesnsis*" read "*clintonensis*".

Pl. XXVIII, Fig. 107, for "*ventricoas*" read "*ventricosa*".

CLEISTOGAMOUS FLOWERS IN THE PANSIES.

BY J. A. NIEUWLAND.

In a former article[1] where reference was made to the presence or absence of cleistogamous flowers in certain groups of violets it was supposed that the pansies were devoid of this peculiar form of self-fertilization. For more than a year we have suspected the possibility of ceistogamay in certain members of the Mnemion group, and particularly in *Viola Rafinesquii*, Greene. Dr. Greene himself first called our attention to the fact that he believed the first flower that appeared on the young plant in spring is "apetalous." Ever since then we have sought an opportunity of examining young plants of *V. Rafinesquii* in order to determine their presence or absence. Such a chance was offered for the first time when Mr. B. F. Bush early this season sent us some excellent fresh material of the plant from Courtney, Missouri.

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[1] Am. Mid. Nat. III. 207 et seg. (1914.)

Wittrock[2] in his extensive and thorough work on the pansies makes reference to certain small-petalled flowers of *V. arvensis* Murr., which he refers to as "*Klandestina blommorna,*" and intimates they are rather well known. A beautiful plate (Tafl. V. a, 70D. 70E). illustrates the fact of much reduced corolla in that plant. None of his drawings, however, show what might be called cleistogamous flowers in the true sense, i. e., those having completely and permanently closed calyx and reduced number of stamens, these latter changed completely in shape of anthers and smaller pollen grains. Wittrock, moreover, does not refer to *V. Rafinesquii*, Greene, as the American plant. Dr. Greene had showed this to be separate a year after and Wittrock had presumably not taken the American plant, if he had seen it, to be different from the European. In fact his references to the origin of the plants rather precludes that any American specimens should have been referred to. Muhlenberg had given the American plant the name *V. tenella* a preoccupied one, but this reference is not even mentioned by Wittrock so that he must have been quite unaware of its identity, or of the distinctive character of the American plant as ever having been mentioned.

Examination of Mr. Bush's specimens revealed the fact that not only is the first flower of *V. Rafinesquii* really cleistogamous, but often the first flower of many of the later basal branches is decidedly apetalous also. The structure of these flowers is in no essential way different from those of the other violets. They show even a more pronounced tendency to have only two very much modified stamens, rather than five as in the caulescent members of the *Lophion* group. (e.g. *V.* or *L. rostratum*). The sepals are rather unequal and always closed completely and permanently over the inner parts. The stamens are club-shaped as in the other group, much smaller, and each with two obovate anthers closely appressed to the characteristically recurved stigma. This latter is quite different in shape and structure from that of the petaliferous flowers. The style is shortened and the stigma reduced and recurved and held in the clasp of the two stamen tips. The pollen germinates without, in most cases, leaving the anther cells and the tubes grow directly into the hollowed style.

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[2] Wittrock, V. B. Acta Horti Bergiani II, No. 1, p. 25, (1897).

The petals, are either totally absent or represented by short linear appendages, and are usually, when present at all, of reduced number. In this case the three abortive stamens are reduced to small appendages or mere pimples. The disappearance of the regular number of stamens and petals is gradual, as in the other stemmed violets (e. g. *V. canadensis* and *V. striata.*)

The presence of cleistogamous flowers in the *Mnemion* group in no way militates directly against the recognition of it as a separate genus, as there are other characters that prompted botanists as early as the very dawn of the science to consider *Viola tricolor* and its associates separate from *Viola odorata.* Ruellius as early as 1542 gave this the name *Pensea* derived from the French *Pensée* whence the common name *Pansy* came. In fact since the cleistogamous flowers in this group when present come before rather than later as in the common violets, it shows that they are of a very different nature having the same character under entirely opposite ecological and physiological conditions In this sense this very identical characteristic is itself an indication of distinctiveness.

BOOK NOTICE.

"The Genus Phoradendron," by William Trelease, Professor of Botany in the University of Illinois, published by the University early in June, is a royal octavo volume, containing 224 pages and 245 plates, with a distribution map.

This monograph of the exclusively American genus to which the mistletoe of the eastern United States belongs contains studies of morphology and geographic distribution, a complete reclassification of these different plants, and descriptions of the 240 species with their 37 varieties recognized as pertaining to the genus. The publication is based on a study of the materials preserved in the great herbaria of the world, from which the descriptions are drawn, and is illustrated by half-tones from photographs of the types, printed on cameo paper, showing in natural size the essential characters of original specimens on which the species are founded. Nine-tenths of these are here figured for the first time.

The work may be secured from the University of Illinois. Price, in paper, $2.00; cloth, $2.50 net.

Pages 380-418, Vol. IV., published April 6, 1916.